

SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8 AI, 13 BIT RESOLUTION, U/I/RESISTANCE/PT100, NI100, NI1000, LG-NI1000, 66 MS MODULE UPDATE, 1 X 40 PIN

### Input current

from backplane bus 5 V DC, max.	90 mA
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### Power loss

Power loss, typ.	0.4 W
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### Analog inputs

Number of analog inputs	8
<ul style="list-style-type: none"> <li>• For resistance measurement</li> </ul>	8
permissible input voltage for voltage input (destruction limit), max.	30 V; 12 V continuous, 30 V for max. 1 s
permissible input current for current input (destruction limit), max.	40 mA

### Input ranges

<ul style="list-style-type: none"> <li>• Voltage</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Current</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Thermocouple</li> </ul>	No
<ul style="list-style-type: none"> <li>• Resistance thermometer</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Resistance</li> </ul>	Yes

### Input ranges (rated values), voltages

<ul style="list-style-type: none"> <li>• 0 to +10 V</li> <li>— Input resistance (0 to 10 V)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• 1 V to 5 V</li> <li>— Input resistance (1 V to 5 V)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• 1 V to 10 V</li> </ul>	No
<ul style="list-style-type: none"> <li>• -1 V to +1 V</li> <li>— Input resistance (-1 V to +1 V)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• -10 V to +10 V</li> <li>— Input resistance (-10 V to +10 V)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• -2.5 V to +2.5 V</li> </ul>	No
<ul style="list-style-type: none"> <li>• -250 mV to +250 mV</li> </ul>	No
<ul style="list-style-type: none"> <li>• -5 V to +5 V</li> <li>— Input resistance (-5 V to +5 V)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• -50 mV to +50 mV</li> <li>— Input resistance (-50 mV to +50 mV)</li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>• -500 mV to +500 mV</li> </ul>	Yes

— Input resistance (-500 mV to +500 mV)	100 k $\Omega$
• -80 mV to +80 mV	No
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	50 $\Omega$
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	50 $\Omega$
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	50 $\Omega$
<b>Input ranges (rated values), thermocouples</b>	
• Type B	No
• Type C	No
• Type E	No
• Type J	No
• Type K	No
• Type L	No
• Type N	No
• Type R	No
• Type S	No
• Type T	No
• Type U	No
• Type TXK/TXK(L) to GOST	No
<b>Input ranges (rated values), resistance thermometer</b>	
• Cu 10	No
• Ni 100	Yes; Standard/climate
— Input resistance (Ni 100)	100 M $\Omega$
• Ni 1000	Yes
— Input resistance (Ni 1000)	100 M $\Omega$
• LG-Ni 1000	Yes; Standard/climate
— Input resistance (LG-Ni 1000)	100 M $\Omega$
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	100 M $\Omega$
• Pt 1000	No
• Pt 200	No
• Pt 500	No
<b>Input ranges (rated values), resistors</b>	

<ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> </ul>	No
<ul style="list-style-type: none"> <li>• 0 to 300 ohms</li> </ul>	No
<ul style="list-style-type: none"> <li>• 0 to 600 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 600 ohms)</li> </ul> </li> </ul>	Yes 100 MΩ
<ul style="list-style-type: none"> <li>• 0 to 6000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 6000 ohms)</li> </ul> </li> </ul>	Yes 100 MΩ
<b>Characteristic linearization</b>	
<ul style="list-style-type: none"> <li>• parameterizable <ul style="list-style-type: none"> <li>— for resistance thermometer</li> </ul> </li> </ul>	Yes yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	200 m; max. 50 m at 50 mV
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> </ul>	13 bit
<ul style="list-style-type: none"> <li>• Integration time, parameterizable</li> </ul>	Yes; 60 / 50 ms
<ul style="list-style-type: none"> <li>• Basic conversion time (ms)</li> </ul>	66 / 55 ms
<ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	50 / 60 Hz
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
<ul style="list-style-type: none"> <li>• for voltage measurement</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> </ul>	Yes; with external supply
<ul style="list-style-type: none"> <li>• for current measurement as 4-wire transducer</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with two-wire connection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with three-wire connection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with four-wire connection</li> </ul>	Yes
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.6 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V)
<ul style="list-style-type: none"> <li>• Current, relative to input range, (+/-)</li> </ul>	0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA
<ul style="list-style-type: none"> <li>• Resistance, relative to input range, (+/-)</li> </ul>	0.5 %; 0 to 6 kohms, 0 to 600 kohms
<ul style="list-style-type: none"> <li>• Resistance thermometer, relative to input range, (+/-)</li> </ul>	1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)
<b>Basic error limit (operational limit at 25 °C)</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.4 %; 0.4% (±5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (±50 mV, 500 mV, 1 V)

- Current, relative to input range, (+/-)
- Resistance, relative to input range, (+/-)
- Resistance thermometer, relative to input range, (+/-)

0.3 %; ±20 mA, 0 to 20 mA, 4 to 20 mA

0.3 %; 0 to 6 kohms, 0 to 600 kohms

1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)

### Interrupts/diagnostics/status information

Diagnosics function	No
<b>Alarms</b>	
• Diagnostic alarm	No
• Limit value alarm	No
<b>Diagnostic messages</b>	
• Diagnostic information readable	No
<b>Diagnostics indication LED</b>	
• Group error SF (red)	No

### Potential separation

<b>Potential separation analog inputs</b>	
• between the channels	No
• between the channels and backplane bus	Yes

### Isolation

Isolation tested with	500 V DC
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### Connection method

required front connector	40-pin
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### Dimensions

Width	40 mm
Height	125 mm
Depth	117 mm

### Weights

Weight, approx.	250 g
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**last modified:** 07/10/2020